Note: Entries in RED indicate data added since the 1997 Compendium. Analog Switches/MUXS AT PRESENT THERE ARE NO ENTRIES FOR THIS DEVICE CATEGORY ASICS AT PRESENT THERE ARE NO ENTRIES FOR THIS DEVICE CATEGORY ADC (6-bit) AT PRESENT THERE ARE NO ENTRIES FOR THIS DEVICE CATEGORY ADC (8-bit) AT PRESENT THERE ARE NO ENTRIES FOR THIS DEVICE CATEGORY ADC (10-bit) AT PRESENT THERE ARE NO ENTRIES FOR THIS DEVICE CATEGORY ADC (12-bit) AT PRESENT THERE ARE NO ENTRIES FOR THIS DEVICE CATEGORY ADC (14-bit) AT PRESENT THERE ARE NO ENTRIES FOR THIS DEVICE CATEGORY ADC (16-bit) AT PRESENT THERE ARE NO ENTRIES FOR THIS DEVICE CATEGORY ADC (16-bit) AT PRESENT THERE ARE NO ENTRIES FOR THIS DEVICE CATEGORY ADC (20-bit) AT PRESENT THERE ARE NO ENTRIES FOR THIS DEVICE CATEGORY	
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ADC (16-bit) AT PRESENT THERE ARE NO ENTRIES FOR THIS DEVICE CATEGORY ADC (20-bit)	
AT PRESENT THERE ARE NO ENTRIES FOR THIS DEVICE CATEGORY ADC (20-bit)	
ADC (20-bit)	
AT PRESENT THERE ARE NO ENTRIES FOR THIS DEVICE CATEGORY	
DAC (8-bit)	
GSFC DAC 08 Bipolar ADI PMI 58 1997	UCD O'Bryan, et al, 98IEEE Wrkshp Rec., pg 39. Iil & Iref out of : 30 krads.
GSFC DAC 08 Bipolar RAY 58 1997	UCD O'Bryan, et al, 98IEEE Wrkshp Rec., pg 39. No parameters of spec @ 30 krads.
DAC (10-bit)	
AT PRESENT THERE ARE NO ENTRIES FOR THIS DEVICE CATEGORY	
DAC (12-bit)	
AT PRESENT THERE ARE NO ENTRIES FOR THIS DEVICE CATEGORY	
DAC (16-bit)	
AT PRESENT THERE ARE NO ENTRIES FOR THIS DEVICE CATEGORY	

Test Org.*	Device	Function	Technology	Mfr.	Proton Energy (MeV)	Device Xsection (cm ²)	Bits Tested	Bit Xsection (cm ²)	Test Date	LU _{th} (MeV)	LU Xsection (cm ² /bit)	Fac.	Remarks 31-Aug-99
	Note: Entries in RE	D indicate data added sin	ce the 1997 Comp	endium.									
		DAC (18-bit)		I		ı							
	AT PRESENT THERI												
DC/DC Power Converters													
GSFC	MHF+2805S	Single output, + 5 V	hybrid	ADA	51				1997			LLU	regulating @ 4.4E10 p/cm2 (~7.5 krads).
GSFC	MHF+2812D	3-Output, + 5 V, + 12 V	hybrid	ADA	51				1997			LLU	O'Bryan, et al, 98IEEE Wrkshp Rec., pg 39. D/C 9603. Ceased regulating @ 4.4E10 p/cm2 (~7.5 krads).
GSFC	MHF+2815D	Dual output, ± 15 V in.	hybrid	ADA	51				1997			ICUF LLU	O'Bryan, et al, 98IEEE Wrkshp Rec., pg 39. Similar to other MHF+ devices (above).
		DSP (16-bit)			ı		ı						
	AT PRESENT THERI	E ARE NO ENTRIES FOR T	HIS DEVICE CATE	GORY									
		DSP (32-bit)			ı		ı	ı	ı			ı	
	AT PRESENT THERI	E ARE NO ENTRIES FOR T	HIS DEVICE CATE	GORY									
				ı	ı	ı			ı				
	AT PRESENT THERI												
		,		ı	ı	ı			ı				
	AT PRESENT THERE ARE NO ENTRIES FOR THIS DEVICE CATEGORY												
		Fiber Optics			ı								
	AT PRESENT THERI	E ARE NO ENTRIES FOR T	HIS DEVICE CATE	GORY									
		FIFOs			I								
	AT PRESENT THERI	E ARE NO ENTRIES FOR T	HIS DEVICE CATE	GORY									
		FPGAs			I								
	AT PRESENT THERI	E ARE NO ENTRIES FOR T	HIS DEVICE CATE	GORY									
		Gate Arrays/PALs/PLAs			I								
	AT PRESENT THERI	E ARE NO ENTRIES FOR T	HIS DEVICE CATE	GORY									
		Line Drvr/Rcvr/Xcvr		I									
	AT PRESENT THERI	E ARE NO ENTRIES FOR T	HIS DEVICE CATE	GORY									
		Logic Devices											
	AT PRESENT THERI	E ARE NO ENTRIES FOR T	HIS DEVICE CATE	GORY									
		SRAMs											
	AT PRESENT THERI	E ARE NO ENTRIES FOR T	HIS DEVICE CATE	GORY									

Test Org.*	Device	Function	Technology	Mfr.	Proton Energy (MeV)	Device Xsection (cm ²)	Bits Tested	Bit Xsection (cm ²)	Test Date	LU _{th} (MeV)	LU Xsection (cm ² /bit)	Fac.	Remarks 31-Aug-99
	Note: Entries in RF	D indicate data added sin	ce the 1997 Comp	pendium.									
		Flash Memories											
	AT PRESENT THER	E ARE NO ENTRIES FOR T	GORY										
		DRAMs											
ICI	KM44S16030CT-GL	16M x 4 (3.3 V)	CMOS	SAM	30	~3.3E-07			1998			UCD	Henson, et al, 99IEEE Wrkshp Rec. Preprint (paper W-7). Fully functional @ 22 krads; device failure at 40 to 60 krads. Some stuck bits.
ICI	KM44S16030CT-GL	16M x 4 (3.3 V)	CMOS	SAM	20	~3.1E-07			1998			UCD	Henson, et al, 99IEEE Wrkshp Rec. Preprint (paper W-7). Fully functional @ 22 krads; device failure at 40 to 60 krads.
ICI	KM44S32030CT-GL	32M x 4 (3.3 V)	CMOS	SAM	~22	~3.0E-07			1998			UCD	Henson, et al, 99IEEE Wrkshp Rec. Preprint (paper W-7). Fully functional @ 17 krads; device failure at 40 to 60 krads.
		Non-Volatile RAMs							I				
	AT PRESENT THER	E ARE NO ENTRIES FOR T	HIS DEVICE CATE	GORY									
							I						
	AT PRESENT THER	E ARE NO ENTRIES FOR T	HIS DEVICE CATE	GORY									
							ı						
	AT PRESENT THER	E ARE NO ENTRIES FOR T	HIS DEVICE CATE	GORY									
		EEPROMs					ı	I	I	I			
	AT PRESENT THER	E ARE NO ENTRIES FOR T	HIS DEVICE CATE	GORY									
		UVEPROMs								I			
	AT PRESENT THER	E ARE NO ENTRIES FOR TI	HIS DEVICE CATE	GORY									
		Microprocessor (4-bit)								I			
	AT PRESENT THER	E ARE NO ENTRIES FOR TI	HIS DEVICE CATE	GORY									
		Microprocessor (8-bit)			I				I	I			
	AT PRESENT THER												
						I							
	AT PRESENT THER	E ARE NO ENTRIES FOR TI	GORY										
		Microprocessor (32-bit)											McDonald, et al, Innovative Concepts Technical Paper. Functional
ICI	PC603e	RISC	0.5 μm CMOS (3.3 V)	MOT	31.6 to 63				1997			UCD	failure at 26 krads.
		Microprocessor (64-bit)											
	AT PRESENT THER	E ARE NO ENTRIES FOR TI	HIS DEVICE CATE	GORY									

Test Org.*	Device	Function	Technology	Mfr.	Proton Energy (MeV)	Device Xsection (cm ²)	Bits Tested	Bit Xsection (cm ²)	Test Date	LU _{th} (MeV)	LU Xsection (cm ² /bit)	Fac.	Remarks 31-Aug-99
	Note: Entries in RI	ED indicate data added sine	ce the 1997 Comp	endium.									
		Microprocessor peripherals					I	I					
	AT PRESENT THER	E ARE NO ENTRIES FOR TH	GORY										
		Coprocessor (32-bit)											
	AT PRESENT THER	E ARE NO ENTRIES FOR TH	GORY										
		Microcontroller											
	AT PRESENT THER	E ARE NO ENTRIES FOR TH	HS DEVICE CATEO	GORY									
		Miscellaneous Controllers											
	AT PRESENT THER	E ARE NO ENTRIES FOR TH	HS DEVICE CATEO	GORY									
		Op-Amp											
	AT PRESENT THER	E ARE NO ENTRIES FOR TH	HS DEVICE CATEO	GORY									
		Optoelectronics											
GSFC	62123	Optocoupler		MPC	58				1997			TRI	O'Bryan, et al, 98IEEE Wrkshp Rec., pg 39. Shows CTR degradation
GSFC	66088	Optocoupler		MPC	63				1997			UCD	and some SETs. O'Bryan, et al, 98IEEE Wrkshp Rec., pg 39. No SETs or CTR
GSFC	66099	Optocoupler		MPC	58				1997			TRI	degradation. O'Bryan, et al, 98IEEE Wrkshp Rec., pg 39. No SETs or CTR
GSFC	66123	Optocoupler		MPC	58				1997			TRI	degradation. O'Bryan, et al, 98IEEE Wrkshp Rec., pg 39. SETs but noCTR
GSFC	4N49	Optocoupler		MPC	58				1997			TRI	degradation. O'Bryan, et al, 98IEEE Wrkshp Rec., pg 39. No SETs or CTR
GSFC	HCPL6651	Оргосопри		HPA	220	1.0E-08			1997			TRI	degradation. O'Bryan, et al, 98IEEE Wrkshp Rec., pg 39. SETs observed. No
GSFC	HCPL6651			HPA	70	1.0E-07			1997			ICUF	CTR degradation. O'Bryan, et al, 98IEEE Wrkshp Rec., pg 39. SETs observed. No
				III A								ICOF	CTR degradation. X-section @ 90°. O'Bryan, et al, 98IEEE Wrkshp Rec., pg 39. SETs with no filte, but:
GSFC	HCPL6651			HPA	58	1.0E-07			1997			TRI	no CTR degradation. No SET or CTR degradation with active or passive filters.
GSFC	P2824			HAM	51.8				1997			LLU	O'Bryan, et al, 98IEEE Wrkshp Rec., pg 39. CTR degradation.
GSFC	P2824			HAM	195				1997			IUCF	O'Bryan, et al, 98IEEE Wrkshp Rec., pg 39. CTR degradation.
		Other Linears											
GSFC	PFORX12	Data Transmission Receiver		ONI	62.5				1997			UCD	O'Bryan, et al, 98IEEE Wrkshp Rec., pg 39. No bit errors up 30 krads. Error bursts at 85 krads.
GSFC	PFOTX12	Data Transmission Xmtr		ONI	62.5				1997			UCD	O'Bryan, et al, 98IEEE Wrkshp Rec., pg 39. No bit errors up 30 krads. Error bursts at 85 krads.
		Resolvers			1				1				
	AT PRESENT THER	E ARE NO ENTRIES FOR TI	HIS DEVICE CATEO	GORY									
	1												

Test Org.*	Device	Function	Technology	Mfr.	Proton Energy	Device Xsection	Bits Tested	Bit Xsection	Test Date	LU _{th} (MeV)	LU Xsection	Fac.	Remarks	
					(MeV)	(cm ²)		(cm ²)			(cm ² /bit)		31-Aug-99	
	Note: Entries in RE	D indicate data added sin	ce the 1997 Comp	endium.										
	SCRs													
	AT PRESENT THERI													
	Voltage Comparator													
	AT PRESENT THERI	E ARE NO ENTRIES FOR TI	HIS DEVICE CATE	GORY										
	Voltage Reference													
GSFC	REF-43	2.5 V ref.	Bipolar	ADI	protons				1997				O'Bryan, et al, 98IEEE Wrkshp Rec., pg 39. Vref sensitivity @ 20-30 krads.	
		Voltage Regulator												
	AT PRESENT THERI	E ARE NO ENTRIES FOR TI	HIS DEVICE CATE	GORY										

Test Org.*	Device	Function	Technology	Mfr.	Proton Energy	Device Xsection	Bits Tested	Bit Xsection	Test Date	LU _{th} (MeV)	LU Xsection	Fac.	Remarks
Org.	20,100	T unction	recumology		(MeV)	(cm ²)	Tested	(cm ²)	Dute	(1.10)	(cm ² /bit)	1 46	31-Aug-99
	Note: Entries in RE	D indicate data added sine	ce the 1997 Compe	ndium.									
Legend:													
	Manufacturers: ADA - Adva	nced Analog Devices; ADI - Analog De	evices, Inc; HAM - Hamama	tsu; HPA - Hewlett-l	Packard; LED -	- Lockheed	Corp; MPC	- Micropac I	Industries; (ONI - Optical l	Networks, Inc	; OPT - Optek;	
	PMI - Precision Monolithic, In	nc; RAY - Raytheon;											
	Test Organizations			Radiation Faci									
	GSFC - Goddard Space Flight	Center, Greenbelt, MD		IU	CF - Indiana U	Iniversity Cy	clotron Fa	cility, Bloomi	ington, IN				
	ICI - Innovative Concepts In	ic., McLean VA	LLU - Loma Linda University Medical Center, Loma Linda, CA										
			TRI - TRI-University Meson Facility, Vancouver, British Columbia, Canada										
				CD - University	of Californ	ia at Davis	Crocker Nuc	lear Labora	tory, Davis, C	A			